



Case Report

Consequences of neck manipulation performed by a non-professional

UK Misra^{*1}, J Kalita¹ and D Khandelwal¹

¹Department of Neurology, Sanjay Gandhi PGIMS, Lucknow, India

Study design: Case report.

Objective: Documentation of complication of neck manipulation by an untrained person.

Setting: Tertiary care referral teaching hospital at Lucknow, India.

Methods: Clinical evaluation, plain radiography of cervical spine, spinal MRI.

Results: A 30-year-old man who fainted after neck manipulation by a barber and developed spinal cord and brainstem dysfunction. His MRI revealed an extramedullary, intradural dumbbell shaped mass on the right side at C1 and C2 level compressing the spinal cord.

Conclusion: Public awareness should be increased about the danger of neck manipulation by an untrained person especially in the communities where it is commonly practiced.

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Introduction

Cervical trauma and neck manipulation may result in a variety of neurological complications and have been attributed to compression or dissection of the vertebral arteries.^{1,2} Rarely underlying silent tumors may be uncovered by neurological deficits following neck manipulation eg tetraplegia and death resulted in an infant with spinal cord astrocytoma who underwent chiropractic manipulation for torticollis.³ In India, neck manipulation is commonly practiced by barbers who perform it after a hair cut and massage. We managed a patient who developed severe neurological deficits following neck manipulation and was found to have a neurofibroma at the first cervical (C1) level. We report this patient and highlight the risk of neck manipulation by untrained persons.

Case report

A 30-year-old healthy man went for a haircut. After a haircut, the barber massaged his head and jerked his neck to the extreme right. The patient blacked out and fainted in his chair. He was immediately placed on the floor in a supine position. After a few minutes, the patient regained consciousness and was lifted back to his home where he noticed a weakness of the right upper and lower limbs. He was unable to lift the right half of his body against gravity. He also noted reduced

sensations on the left side below the neck. Next morning, he had retention of urine for which he had to be catheterized for 1 day. He was advised rest and given cervical traction for 3 weeks in the local hospital after which he was able to walk independently. He remained in this condition for 9 months and reported to us because of persistent weakness on the right side and urgency of micturition. His past medical history was not significant.

On examination, the patient was of average build and nutrition, with pulse of 90/min, regular, BP 130/80 mmHg and cranial nerves were normal. Muscle power on the right side was grade 3 and on the left side grade 4 on a 0–5 Medical Research Council scale. There was mild spasticity in all four limbs. Biceps, triceps, knee and ankle reflexes were exaggerated and plantar equivocal. Pain sensation was reduced by 50% below C3 spinal level on the left side. Joint position and vibration sensations were normal. The patient also had frequency, urgency and precipitancy of micturition. There was no Horner's syndrome and the corneal reflex was normal. In the right upper limb, there was past pointing and intention tremor. Cardiovascular, respiratory and abdominal examinations were normal.

His blood count, urinalysis and serum chemistry was normal. Radiographs of the chest and cervical spine and an electrocardiogram did not reveal any abnormality. MRI of the cervical spine revealed an extramedullary intradural dumbbell shaped mass on the right side at C1 and C2 level compressing the spinal cord to the left (Figure 1a,b). The mass was

*Correspondence: UK Misra, Department of Neurology, Sanjay Gandhi Post Graduate Institute of Medical Sciences, Rae Bareilly Road, Lucknow, India

touching the vertebral artery without compressing it. The mass was isointense on T1, hyperintense on T2 and enhancing on contrast. The radiological findings were suggestive of neurofibroma.

Discussion

Our patient fainted after neck manipulation and was found to have residual spastic tetraparesis, left sided pinprick sensory loss below C3 and right sided cerebellar signs. The immediate unconsciousness and spinal cord syndrome may be due to neck manipulation resulting in vertebral artery compression. The mechanism of brain ischemia after neck motion is due to hemodynamic interruption of blood flow, arterial spasm and damage to the blood vessel.^{2,3} Head rotation is often followed by an asymptomatic interruption of blood flow in one or both vertebral

arteries at the level of the atlantoaxial joint. At the exit of the vertebral artery through the bony foramina of atlas there is an abrupt kinking of the artery, when the head is rotated more than 50°. C1 and C2 are the site where the vertebral arteries are most subjected to mechanical stretching and compression during head turning. The presence of a tumor at C1–C2 level in our patient would have further contributed to the ischemia. In our patient the neck was rotated to the extreme right. Chiropractic manipulation results in a wide variety of neurological syndromes including paralysis and disc herniation. In a study of 36 patients with stroke following chiropractic manipulation the clinical syndrome included occipital infarction in 5%; cerebellar syndrome and locked in syndrome in 8% each, Wallenberg syndrome in 28%, other brainstem syndromes in 49% and unclassifiable syndromes in 2% patients. Mortality or severe deficits have been reported in 28% patients.¹

A neurofibroma may lie silent for long and may be discovered accidentally.⁵ Our patient did not have symptoms due to the tumor before the neck manipulation. Following the neck manipulation he developed a neurological deficit which improved during the first month and the clinical picture remained stationary thereafter. Therefore, there does not seem to have been any progression of compression. Based on clinical and radiological findings, the role of neurofibroma in producing persistent neurological deficit cannot be excluded. Unconsciousness and cerebellar signs in our patient are most likely due to vertebral artery ischemia although an MRI did not reveal any infarction which may be due to a long delay in carrying out MRI after neck manipulation. The contribution of neurofibroma in producing vertebral artery ischemia during neck manipulation is also likely.

It can be concluded that neck manipulation can be dangerous and should be avoided. Special awareness should be created in the communities where it is commonly practised.

Acknowledgments

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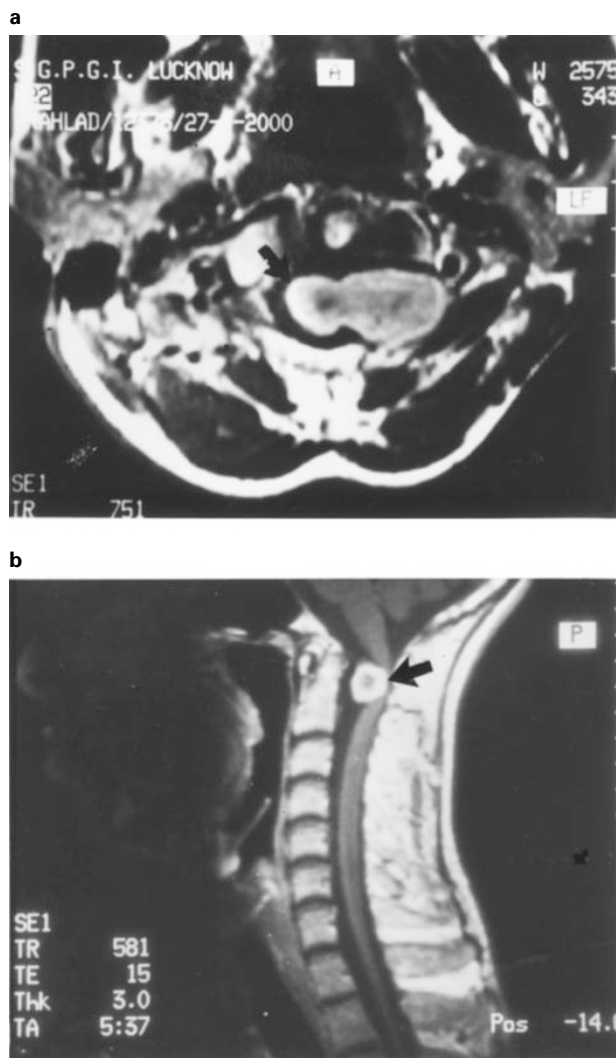


Figure 1 Spinal MRI (a) axial section, (b) sagittal T₁ sequence showing enhanced dumbbell shaped mass displacing the spinal cord at C1 level